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**ENTITLED
IUE OBSERVATIONS OF EARTH'S AURORA**

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Publications and Papers Presented

None.

Synopsis of Research

We attempted to observe Earth's nightside aurora using the high-dispersion mode of the SWP camera. In the 1150–1950 Å wavelength range there are several interesting auroral emissions, and the background is negligible. Important features include the strong resonance triplet of atomic oxygen at 1304 Å, the forbidden doublet of O I 1356 Å, strong multiplets of atomic nitrogen at 1200 Å, 1493 Å, and 1744 Å, and the N₂ LBH bands from 1270–1950 Å. The primary objective was to study the line profiles and line ratios of the strong O I 1304 Å triplet in the aurora.

Initial observations were performed in August, 1990, and the rather difficult tracking (roughly 10–15 °/hour) was tested successfully. With some minor difficulties, we obtained one low dispersion and one high dispersion spectrum of the high latitude Earth showing the expected H I 1216 Å and O I 1304 Å, 1356 Å emissions, and successfully re-oriented the IUE to the celestial frame. Due to problems with our tracking program we feel that the observed emissions were mostly from the Earth's dayglow and not the aurora.

For the second set of observations in February, 1991, we improved our tracking program and obtained two long (60 and 100 min), high-dispersion exposures of a part of the nightside south polar auroral region. The recovery of the IUE attitude after the high slew rates needed to look at a fixed region on the Earth was excellent, with the telescope pointing to within 15' of where we expected it to be. Unfortunately, there was no auroral activity in the region we observed. The H I 1216 Å, O I 1304 Å, and O I 1356 Å emissions were again present, although the signal levels were such as could be accounted for by the sunlit part of the line-of-sight to the nightside auroral region. Although the results are disappointing, we clearly demonstrated the feasibility of observing specific regions on the Earth, requiring very large slew rates, and then recovering the attitude of the IUE without incident. A proposal for the 14th year of IUE observations to look for auroral and dayglow emissions was turned down.